

Be sure to show all work, use the correct number of significant figures, circle final answers and use correct units in all problems.

1. Ammonia (NH_3) is synthesized through the combination of hydrogen and nitrogen gases. What mass of nitrogen gas must be reacted to create ammonia at 3.00 atm in a 2.50 L flask at 100. °C? *Hint: write a balanced equation!* (6 pts)

2. Calculate the density (g/L) of gaseous phosphorus pentachloride at STP to three significant figures. (5 pts)

3. What volume of O_2 , measured at 44.3 °C and 766 mm Hg, will be produced by the decomposition of 4.27 g NaClO_3 ? (5 points)
 $2 \text{ NaClO}_3(\text{s}) \rightarrow 2 \text{ NaCl}(\text{s}) + 3 \text{ O}_2(\text{g})$

4. The lid is tightly sealed on a rigid flask containing 3.50 L H_2 at 17.0 °C and 694 torr. If the flask is heated to 71 °C, what is the pressure in the flask in atm? (4 points)